



Application No. 09/846,410

Application No. 09/846,410

11/30/2007

Filing date 02/13/2001

Name Urbain A. von der Embse

Unit 2611

Examiner Jason M. Perilla

ALLOWANCE AND FEE(S)

Attached are:

- Received cover letter with mailing date 11/23/2007
- Completed Notice of Allowance
- PTO-2038 fee payment by credit card
- Notice of Allowability

Thanks for all of your help and guidance.

Sincerely,

*Urbain A. von der Embse*

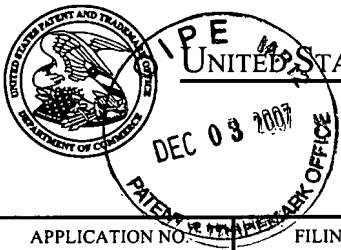
Name Urbain A. von der Embse

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Westchester, CA 90045-2444



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,410	02/13/2001	Urbain Alfred von der Embse		1502

7590 11/23/2007

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WESTCHESTER, CA 90045-2444

EXAMINER

PERILLA, JASON M

ART UNIT	PAPER NUMBER
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2611

DATE MAILED: 11/23/2007

**Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**  
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 751 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 751 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.



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## NOTICE OF ALLOWANCE AND FEE(S) DUE

Urbain Alfred von der Embse  
7323 W. 85TH ST.  
WESTCHESTER, CA 90045-2444

11/23/2007

EXAMINER

PERILLA, JASON M

ART UNIT

PAPER NUMBER

2611

DATE MAILED: 11/23/2007

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,410	02/13/2001	Urbain Alfred von der Embse		1502

TITLE OF INVENTION: MULTIPLE DATA RATE COMPLEX WALSH CODES FOR CDMA

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1440	\$0	\$0	\$1440	02/25/2008

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

**HOW TO REPLY TO THIS NOTICE:****I. Review the SMALL ENTITY status shown above.**

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

**II. PART B - FEE(S) TRANSMITTAL**, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

**III.** All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.



### Notice of Allowability

Application No.	Applicant(s)	
09/846,410	VON DER EMBSE, URBAIN ALFRED	
Examiner	Art Unit	
Jason M. Perilla	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed September 5, 2007.
2. ☒ The allowed claim(s) is/are claims 5-9 renumbered respectively as claims 1-5.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All   b) ☐ Some\*   c) ☐ None   of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

#### Attachment(s)

- |  |  |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 5. <input type="checkbox"/> Notice of Informal Patent Application  |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date <u>20071120</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment  |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance                                    |
|  | 9. <input type="checkbox"/> Other _____  |

Application/Control Number:  
09/846,410  
Art Unit: 2611



Page 2

### EXAMINER'S AMENDMENT

1. Claims 5-9 are pending in the instant application.
2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Urbain A. von der Embse on November 20, 2007.

The application has been amended as follows wherein the following versions of claims 5-9 replace all prior versions in their entirety:

Claim 5. A method for generating and applying N hybrid Walsh complex orthogonal codes for code division multiple access (CDMA), said method comprising the steps:

generating N Walsh codes  $W(c)$  with code index  $c=0,1,2,\dots,N-1$ , each with N chips where N is a power of 2,

generating said N hybrid Walsh codes  $\tilde{W}(c)$  by reordering each of said N Walsh codes into a corresponding real component and a corresponding imaginary component of a hybrid Walsh code

as defined by equations

$$\text{for } c = 0, \quad \tilde{W}(c) = W(0) + jW(0)$$

$$\text{for } c = 1,2,\dots,N/2-1, \quad \tilde{W}(c) = W(2c) + jW(2c-1)$$

$$\text{for } c = N/2, \quad \tilde{W}(c) = W(N-1) + jW(N-1))$$

$$\text{for } c = N/2+1,\dots,N-1, \quad \tilde{W}(c) = W(2N-2c-1)+jW(2N-2c)$$

wherein  $j=\sqrt{-1}$ ,

wherein said N hybrid Walsh codes are generated by reading the N Walsh codes chip values from a Walsh code memory in a digital signal processor and writing the reordered Walsh codes to a hybrid Walsh code memory,

applying said N hybrid Walsh codes in an encoder and in a decoder of a CDMA system by encoding transmitting data and decoding receiving data with replacing existing said N Walsh real codes with said N hybrid Walsh complex codes according to a same code vector indexing, and

transmitting data encoded by the encoder and receiving data decoded by the decoder.

Claim 6. A method for generating and applying spreading codes for code division multiple access (CDMA), comprising the steps:

constructing a P by P Discrete Fourier Transform (DFT) code matrix E having row vectors and column elements and ~~using said DFT matrix as a spreading code with code matrix E~~ wherein said row vectors are code vectors, and said column elements are code elements, and P is an integer,

constructing ~~a spreading code from a hybrid Walsh code~~ having row vectors and column elements and ~~a DFT code, said spreading code is defined by an N\*P row by N\*P column code matrix C~~ wherein row vectors are code vectors and column elements are code ~~chips~~ elements,

said hybrid Walsh code is defined by a N row by N column code matrix  $\tilde{W}$  where N is a power of 2,

constructing said a spreading code matrix C ~~is constructed~~ by a Kronecker product of said hybrid Walsh code matrix  $\tilde{W}$  with said DFT code matrix E defined by the equation

$$C = \tilde{W} \otimes E$$

wherein the operator " $\otimes$ " is a Kronecker product operation and said spreading code is defined by an N\*P row by N\*P column code matrix,

applying said spreading code matrix C in an encoder and in a decoder of a CDMA system by encoding data and decoding data with replacing existing real Walsh code matrix W with said hybrid Walsh complex code said spreading code matrix C, and

transmitting data encoded by the encoder and receiving data decoded by the decoder.

Claim 7. A method for implementing hybrid Walsh codes for code division multiple access (CDMA), comprising the steps:

encoding N data symbols contained in a block with respective N hybrid Walsh codes to yield N encoded data symbols for each block at the output chip rate of  $1/T$  chips per second wherein T is the interval between chips and N is a power of 2,

wherein said encoder accepts up to N users per block ~~wherein N is a power of 2~~ and M is ~~the~~ an actual number of users represented in the block, each of said users having a data rate corresponding to one of  $1, 2, \dots, N/2$  data symbols per block,

wherein said encoder accepts packets from each user and writes them to memory "A" for each block, wherein a binary address index comprising a number of bits corresponding to the maximum number of users N is used for addressing said data symbols stored in memory "A" and the data symbols for each user of the block are stored in memory "A" in a hierarchy such that a particular user is selected according to a number of more significant bits of the binary address index and the data symbols of the particular user are selected according to a number of lesser significant bits of the binary address index, the number of more significant bits and lesser significant bits of the particular user being determined according to the data rate of the particular user and the total number of users M per block.

Claim 8. Wherein said encoder ~~hybrid Walsh codes~~ in claim 5 have implements a fast encoding implementation algorithm, comprising the steps:

wherein said fast encoding algorithm implemented in ~~the~~ said encoder uses memory "A" for input and to support pass 1 and uses memories "B", and "C" to support passes  $2, \dots, M$  wherein  $N=2^M$  and M is an integer and uses memory "D" to store the encoded chip output from ~~the~~ a reordering pass,

writing input data symbol vector  $Z(d_0, d_1, \dots, d_{M-2}, d_{M-1})$  to said memory "A" ~~wherein the~~ at binary addressing word values ~~takes address values~~  $d_0, d_1, \dots, d_{M-2}, d_{M-1} = 0, 1, 2, \dots, N-1, d_0, d_1, \dots, d_{M-2}, d_{M-1}$ ,

wherein

on pass  $m=1$ , reads reading pairs of data symbols from "A" and ~~performs~~ performing a two-point hybrid Walsh transform on ~~the~~ two data symbols in each pair specified

by the a binary data addresses  $d_{M-1}=0,1$  and writes writing the output to "B" at a  
reordered  $d_{M-1}$  binary data address, ~~the same addresses re-labeled with the~~  
~~binary chip addresses  $n_0=0,1$ ,~~

on pass  $m=2$ , reads reading pairs of data symbols from "B" and performs performing  
a two-point hybrid Walsh transform on the two data symbols in each pair  
specified by the a binary data addresses  $d_{M-2}=0,1$  and writes writing the output to  
"C" at a reordered  $d_{M-2}$  binary data address, ~~the same addresses re-labeled with~~  
~~the binary chip addresses  $n_1=0,1$ ,~~

on pass  $m=3$ , continues this processing by reading pairs of data symbols from "C" and  
performing a two-point hybrid Walsh transform on two data symbols in each pair  
with the specified by a binary addresses  $d_{M-3}=0,1$  and writing the 2-point hybrid  
Walsh transform output to "B" at a reordered  $d_{M-3}$  binary data address, ~~the same~~  
~~addresses re-labeled with the binary chip addresses  $n_2=0,1$ ,~~

continuing passes  $m=4, \dots, M-1$ , ~~M continues this processing using memories "B" and "C"~~  
and data binary addresses  $d_{M-4}$  through  $d_0$ ,

pass  $m=M$  completes the calculation of the fast hybrid Walsh transform by performing a  
two-point hybrid Walsh transform pass  $m=M$  on the two data symbols specified  
by the binary data addresses  $d_0=0,1$  and writing the output to the other memory  
at the same addresses re-labeled with the binary chip addresses  $n_{M-1}=0,1$ ,

write writing the output of pass  $m=M$  is the in an encoded chip vector  $Z(n_{M-1}, \dots, n_0)$   
stored in bit-reversed order,

performing wherein a final reordering pass to reorders reorder the encoded chip vector  $Z$   
and stores the ordered store the reordered output chip vector  $Z(n_0, n_1, \dots, n_{M-2},$   
 $n_{M-1})$  in memory "D", and

wherein said encoder ~~in said CDMA transmitter~~ reads said encoded chip vector  $Z$  in said  
"D" and overlays said encoded chip vector with long and short pseudo-noise (PN)  
codes to generate  $N$  chips of ~~said encoded chip vector~~ for transmission.

Claim 9. Wherein said decoder hybrid Walsh codes in claim 5 have implements a fast  
decoding implementation algorithm, comprising the steps:

wherein said fast decoding algorithm implemented in said decoder uses memory "A" for  
input and to support pass 1 and uses memories "B" and "C" to support passes 2.



...M wherein  $N=2^M$  and M is an integer and uses memory "D" to store the decoded chip output from a reordering pass.

removing ~~wherein the decoder strips off said pseudo-noise (PN) codes from the a~~  
received N-chip encoded chip vector and ~~writes~~ writing the resultant encoded  
chip vector  $Z(n_0, n_1, \dots, n_{M-2}, n_{M-1})$  to said memory "A" ~~wherein the a~~ binary  
addressing word values ~~takes address values~~  $n_0, n_1, \dots, n_{M-2}, n_{M-1} = 0, 1, 2, \dots, N-1, n_0,$   
 $n_1, \dots, n_{M-2}, n_{M-1},$

wherein

on pass  $m=1$ , ~~reads~~ reading pairs of chip symbols from "A" and ~~performs~~ performing a  
two-point hybrid Walsh inverse transform on the two chip symbols in each pair  
specified by the a binary chip addresses  $n_0=0,1$  and ~~writes~~ writing the output to  
"B" at a reordered  $n_0$  binary data address ~~the same addresses re-labeled with the~~  
~~binary data addresses~~  $d_{M-1}=0,1,$

on pass  $m=2$ , ~~reads~~ reading pairs of chip symbols from "B" and ~~performs~~ performing  
a two-point hybrid Walsh inverse transform on the two chip symbols in each pair  
specified by the a binary chip addresses  $n_1=0,1$  and ~~writes~~ writing the output to  
"C" at a reordered  $n_1$  binary data address ~~the same addresses re-labeled with the~~  
~~binary data addresses~~  $d_{M-2}=0,1,$

on pass  $m=3$  ~~continues this processing by~~ reading pairs of chip symbols from "C" ~~and~~  
performing a two-point hybrid Walsh inverse transform on two chip symbols in  
each pair with the ~~specified by a~~ binary addresses  $n_2=0,1$  and writing the 2-point  
hybrid-Walsh-inverse-transform output to "B" at a reordered  $n_2$  binary data  
address ~~the same addresses re-labeled with the binary chip addresses~~  $d_{M-3}=0,1,$

continuing passes  $m=4, \dots, M-1, M$  ~~continue this processing using memories "B" and "C"~~  
and data binary addresses  $n_3$  through  $n_M$ .

pass  $m=M$  ~~completes the calculation of the fast hybrid-Walsh-inverse-transform by~~  
performing a two-point hybrid-Walsh-inverse-transform on the two data symbols  
specified by the binary chip addresses  $n_{M-1}=0,1$  and writing the output to the  
other memory at the same addresses re-labeled with the binary chip addresses  
 $d_0=0,1,$

writing the ~~write~~ output of pass  $m=M$  is the data in a decoded data symbol vector  $Z(d_{M-1},$   
 $\dots, d_0)$  stored in bit-reversed order,

performing wherein a final scaling pass that scales the decoded data symbol vector  $\underline{Z}$  by the a  $N$ -chip hybrid Walsh inverse transform scaling factor " $1/2N$ ", and reorders the scaled data symbol vector, and stores the reordered data symbol vector as output vector  $Z(d_0, d_1, \dots, d_{M-2}, d_{M-1})$  in memory "D", and

wherein said decoder in said CDMA receiver reads said decoded data symbol output vector in said "D" for further processing to recover information from the data symbols.

Claims 5-9 are renumbered respectively as claims 1-5, and the claim dependency is renumbered accordingly.

### ***Allowable Subject Matter***

3. Claims 5-9 renumbered respectively as claims 1-5 are allowed.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Perilla whose telephone number is (571) 272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:  
09/846,410  
Art Unit: 2611

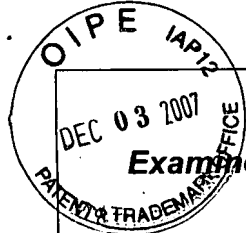
Page 8

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Jason M. Perilla  
November 20, 2007

jmp  
4.

  
CHIEH M. FAN  
SUPERVISORY PATENT EXAMINER



# **Examiner-Initiated Interview Summary**

**Application No.**

09/846,410

**Applicant(s)**

VON DER EMBSE, URBAIN  
ALFRED

**Examiner**

Jason M. Perilla

**Art Unit**

2611

**All Participants:**

(1) Jason M. Perilla.

(2) Urbain A von der Embse.

**Status of Application:** Pending

(3) \_\_\_\_\_

(4) \_\_\_\_\_

**Date of Interview:** 20 November 2007

**Time:** 10am

**Type of Interview:**

☒ Telephonic

☐ Video Conference

☐ Personal (Copy given to: ☐ Applicant ☐ Applicant's representative)

**Exhibit Shown or Demonstrated:** ☐ Yes ☐ No

If Yes, provide a brief description:

**Part I.**

Rejection(s) discussed:

Claims discussed:

5-9

Prior art documents discussed:

**Part II.**

**SUBSTANCE OF INTERVIEW DESCRIBING THE GENERAL NATURE OF WHAT WAS DISCUSSED:**

*Applicant reviewed and approved a proposed Examiner's Amendment to place the case into direct condition for allowance.*

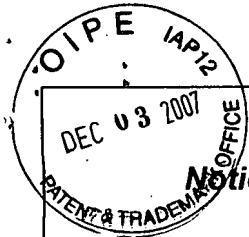
**Part III.**

☒ It is not necessary for applicant to provide a separate record of the substance of the interview, since the interview directly resulted in the allowance of the application. The examiner will provide a written summary of the substance of the interview in the Notice of Allowability.

☐ It is not necessary for applicant to provide a separate record of the substance of the interview, since the interview did not result in resolution of all issues. A brief summary by the examiner appears in Part II above.

  
(Examiner/SPE Signature)

\_\_\_\_\_  
(Applicant/Applicant's Representative Signature – if appropriate)



# **Notice of References Cited**

Application/Control No. 09/846,410	Applicant(s)/Patent Under Reexamination VON DER EMBSE, URBAIN AL	
Examiner Jason M. Perilla	Art Unit 2611	Page 1 of 1

## **U.S. PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,311,176	05-1994	Gurney, David P.	341/50
*	B	US-6,389,138	05-2002	Li et al.	380/35
*	C	US-6,674,712	01-2004	Yang et al.	370/208
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

## **FOREIGN PATENT DOCUMENTS**

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

## **NON-PATENT DOCUMENTS**

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.